

Name: \_\_\_\_\_

## **Final Exam Study Guide**

### **Algebra 1A 2015**

**\*We will be completing this study guide in parts. If you know how to complete all problems on this Study Guide AND complete additional suggested items, you will do very well on the Final Exam.**

**\*If you choose to skip a night of studying and practice, you probably will not do as well as you would like!**

**\*Remember that you should also practice ADDITIONAL problems offered, actively PARTICIPATE in all classroom REVIEW, and attend TUTORIAL!**

**\*Twenty minutes per night starting TONIGHT!**

**\*Please answer all written responses in at least TWO complete sentences using at least TWO algebraic terms.**

## Part One: Expressions and Order of Operations

### Extra Practice:

**1. Algebraic Writing:** Answer each question in complete sentences using algebraic terms. Be sure to echo the prompt.

a. Name one similarity and one difference between an expression and an equation. Be sure that the similarity and the difference each relate to algebra.

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b. Between multiplication and division, how do you decide which operation should be performed first in an expression?

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c. What does algebra mean in Arabic? Explain how this definition makes sense by **relating it to at least one of the algebraic terms from this year.**

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**2. Symbols to Represent Operations :** Given that  $g \& h$  means  $3g - h$ , evaluate the following.

a.  $6 \& 1$

b.  $-3 \& 4$

**3. Writing Algebraic Expressions and Equations:** Write an algebraic expression or equation for each. Draw a smiley face to the right for an extra point.

a. the quotient of eleven and x

b. twice a number z increased by two

c. The sum of two and z is y.

**4. Evaluating Expressions:** Evaluate each expression if  $x = 2$ ,  $y = 4$  and  $z = 3$ .

a.  $xyz$

b.  $2y - x + z$

c.  $3(y - z + x)$

**5. Order of Operations:** Show all work and box your final answers.

a.  $6 - 1 + 7$

b.  $\frac{2(5) + 8 - 3}{11 - 6}$

c.  $20 - [2(6 + 3) - 10] + 1$

d.  $4 + 5(3) - 6 + 11$

## 6. Integer Operations:

a. $2 - 5 =$	b. $2 + (-5) =$	c. $-2 - 5 =$
d. $-2 - (-5) =$	e. $2(5) =$	f. $(-2)(-5) =$
g. $(-2)(5) =$	h. $2(-5) =$	i. $10/(-2) =$

## 7. Opposites and Absolute Value:

a. What is the opposite of eight?

b. What is the absolute value of eight?

c. What is the product of the absolute value of negative one and the opposite of five?

d. What is the sum of the opposite of six and the opposite of negative three?

**8. Word Problem:** A diver is thirty-five feet below the surface of the water. He swims even further down for another fifty-two feet. What is his depth, with respect to the surface of the water? Write your answer as an integer and explain how you arrived at your answer.

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## Part Two: Simplifying Expressions

### Extra Practice:

9. Give an example of two like terms and explain HOW they are like terms.

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10. What two operations does the distributive property combine in this example? Explain.  
Example:  $-12(3 + 7)$

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11. Are the terms  $12a^2b$  and  $16ab^2$  like terms? Explain your reasoning.

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**Simplifying Expressions:** Simplify each expression as completely as possible. BOX your final answers.

12.  $5 - 4 + 8 - 7$

13.  $6(5x + 1)$

14.  $-(x - 5)$

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15. $-11(2w + 3)$	16. $4(2y + 2) + 7y$	17. $6x + 4x$
18. $6x - 4x$	19. $-6x - 4x$	20. $-6x - (-4x)$
21. $6(w - 3) - w + 1$	22. $a + b + a + b + a + b$	23. $-10y - 9 + 3y - 11$

**24. Matching:** Please write the CAPITAL LETTER of the expression that matches each phrase.

- A.  $4y$       B.  $4 + y$       C.  $4(2 + y)$       D.  $4 - y$       E.  $y - 4$   
F.  $2(4 + y)$       G.  $4 + 2y$       H.  $4/y$       I.  $2(y - 4)$       J.  $2y - 4$

- \_\_\_\_\_ the sum of four and twice y  
\_\_\_\_\_ the quotient of four and y  
\_\_\_\_\_ four decreased by y  
\_\_\_\_\_ four less than y  
\_\_\_\_\_ the product of four and y  
\_\_\_\_\_ two times the difference of y and four  
\_\_\_\_\_ the sum of four and y  
\_\_\_\_\_ four multiplied by the quantity of two plus y  
\_\_\_\_\_ twice y subtracted by four  
\_\_\_\_\_ two multiplied by the sum of four and y

**25. Word Problem:**

Some WLPCS students go to the zoo and see some lions.

- a. Define a variable to represent the number of lions. \_\_\_\_\_
- b. They see five more leopards than lions. Write an expression for the number of leopards they see, using your variable from part a.
- \_\_\_\_\_
- c. They see twice as many monkeys as leopards. Write an expression for the number of monkeys they see, using your variable from part a.
- \_\_\_\_\_
- d. Write AND SIMPLIFY an expression for the total number of lions, leopards and monkeys the students see. BOX your final answer.



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**Part Three: Probability and Properties**

26. **Six-Sided Die:** Calculate the following probabilities if you are rolling a six-sided number die. Reduce all fractions.

a. $P(3)$	b. $P(\text{odd})$	c. $P(\text{not } 1)$
d. $P(1, 2, 3)$	e. $P(\text{odd, odd, odd})$	d. $P(1, 5, 7)$

27. **Compound Probability without Replacement:** You are picking out your clothes for the week. Once you wear a shirt, you will not wear the shirt again that week. Suppose you have **three red shirts, four blue shirts, one white shirt, and two green shirts.**

What is the probability that you will randomly wear a white shirt, then a blue shirt?

**28. Matching Properties:** Write the CAPITAL LETTER of the property that each example illustrates.

**Property Word Bank:**

A. Inverse Property of Multiplication

B. Inverse Property of Addition

C. Commutative Property of Addition

D. Associative Property of Addition

E. Multiplication Property of Zero

F. Distributive Property

i.  $6 + (12 + 3) = (6 + 12) + 3$  \_\_\_\_\_

ii.  $6 + (12 + 3) = 6 + (3 + 12)$  \_\_\_\_\_

iii.  $6 + (-6) = 0$  \_\_\_\_\_

iv.  $6(12 + 3) = 6(12) + 6(3)$  \_\_\_\_\_

v.  $6\left(\frac{1}{6}\right) = 1$  \_\_\_\_\_

vi.  $6(0) = 0$  \_\_\_\_\_

**29. Multiple Choice:** Write the CAPITAL LETTER of the correct answer choice.

i. \_\_\_\_\_ This property states that "If  $a = b$ , then  $b = a$ ."

A. Inverse Property of Equality

B. Distributive Property

C. Associative Property of Addition

D. Symmetric Property

ii. \_\_\_\_\_ Use the Commutative Property of Multiplication to rewrite the following expression:  
 $xyz =$  \_\_\_\_\_

A.  $xzy$

B.  $x(y + z)$

C.  $yxz$

D. Both A and C

E. Both B and C

iii. \_\_\_\_\_ Which equation illustrates the Identity Property of Addition?

A.  $7 + 0 = 7$

B.  $7 + (-7) = 0$

C.  $7 - 7 = 0$

D.  $7 + 8 = 8 + 7$

iv. \_\_\_\_\_ Which property is illustrated by the equation:  $a(bc) = (ab)c$ ?

A. Associative Property of Addition

B. Commutative Property of Addition

C. Associative Property of Multiplication

D. Commutative Property of Multiplication

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## Part Four: Equations and Inequalities

**30.** Equations: Solve each equation. Show all work and box your final answer.

a.  $3a = -12$

b.  $b + 7 = -15$

c.  $4(c - 2) = 16$

d.  $12 + \frac{d}{-3} = 10$

e.  $12e + 5 - 8e = 25$

f.  $10(2f + 1) - 8f = 12f + 1$

g.  $5g + 2 + 7g = 6(2g + 1) - 4$

h.  $\frac{1}{5}h = -40$

31. What is the major goal of solving an equation?

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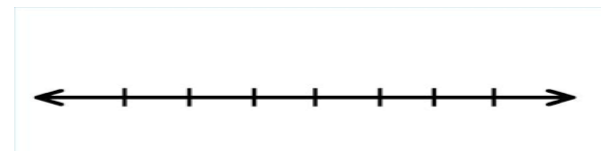
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**32. Justifying Steps while Solving an Equation:** Justify each step of the equation with an algebraic property.

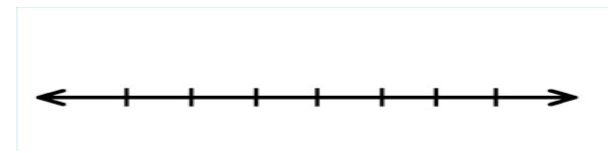
Steps	Justifications
$-5(2x + 1) = 15$	Given
$-10x - 5 = 15$	
$-10x = 20$	
$x = -2$	

**33. Solving Inequalities:** Solve and graph each inequality on the number line.

a.  $a + 8 < -2$



b.  $-6b \geq 18$



c.  $-10 < c + 5 \leq -8$



c.  $d < -1$  OR  $d \geq 2$



**34. Word Problem:** You must solve this word problem algebraically and complete all steps. **CHOOSE ONE WORD PROBLEM!**

Cate purchased five water toys and spent an additional three dollars at Target. Nick purchased three water toys and spent an additional fifteen dollars at Target. If Cate and Nick spent exactly the same amount of money, what is the cost of one water toy?

Khalil wants to design his own set of playing cards. He wants the length of the cards to be four inches more than the width of the cards. He wants the perimeter of the cards to be no more than forty inches. What is the maximum width his cards can be?

a. Define a variable that makes sense for the situation. Use the magic word. Draw a picture if you are completing Khalil's problem.

b. Write an equation or inequality that describes the situation.

c. Solve the equation/inequality.

d. Check via substitution and reality.

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## **Part Five: Percent Change/Interest**

**35. Percent Change:** Calculate the percent change for each situation. Round to the nearest hundredth, if necessary.

$$\frac{\text{New} - \text{Original}}{\text{Original}} \times 100$$

a. A tree branch is fifteen feet long. After a storm, it breaks and is only three feet long.

b. Chris deposits \$400 in his bank account. Two months later, he has \$450 in his bank account.

**36. Simple Interest:** Please answer each question. Round to the nearest cent, if necessary.

$$I = prt$$
$$\text{Total} = I + p$$

a. Mr. Frog deposits \$30,400 into a bank account that gives 3% simple annual interest. How much interest will he earn after four years?

b. Mr. Toad purchases an umbrella for \$20 on a credit card that charges 15% simple monthly interest. What is the TOTAL AMOUNT he will owe after three months if he makes no payments?

**37. Simple vs. Compound Interest:** Which table could represent compound interest? Justify your answer. Be sure to use algebraic terms.

**Table A:**

Month	1	2	3	4
Total Amount	\$210	\$220.5	\$231.53	\$243.11

**Table B:**

Month	1	2	3	4
Total Amount	\$210	\$220	\$230	\$240

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**38.** If you were lending your friend \$50, would you charge that friend simple or compound interest? Justify your answer.

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